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Determinants of Portfolio Flows into CIS Countries

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Contents

Abstract

This paper employs a standard Tobin-Markowitz framework to analyse the determinants of capital flows into the CIS countries. Using data from 1996-2006, we find that the Russian financial crisis of 1998 has had a profound impact on capital flows into the CIS (both directly and indirectly). Firstly, it introduced a structural shift in the investors' behaviour by shifting the focus from the external factors to the internal ones, e.g. domestic interest and GDP growth rates. Secondly, it also drastically changed the impact of a number of explanatory variables on capital flows into the CIS. Political risk was found to be the second most important determinant of capital flows into the CIS. Additionally, we report some strong evidence of co-movement between portfolio flows into the CIS and CEEC, coupled with strong complementarity between global stock market activity and portfolio inflows into the CIS. Interestingly, external factors tend to be of a higher significance than internal factors for the largest members (Russia, Ukraine and Kazakhstan) of the CIS; whereas domestic variables tend to have a greater impact on the capital flows into the smaller CIS countries.

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Introduction

Private capital flows to developing countries have massively increased in recent years. From 2002-2005 alone, total private capital flows to the emerging markets and developing economies increased roughly 2.7 times as compared with 1998-2001[1]. Some of this capital has been heading to the CIS, a region whose prospects have improved considerably since the 1998 Russian financial crisis. Although the amount of capital flows into the CIS had been largely insignificant before the crisis and shortly thereafter, the share of the CIS countries in global private capital flows has averaged a more impressive 13% from 2002-2005. Attracted by strong economic growth in the majority of the CIS countries in the new millennium, international investors have begun investing in the CIS to exploit potentially lucrative investment opportunities. Yet this investment has been primarily direct investment, due to the undeveloped CIS financial markets coupled with a poor governance environment, Li (2005).

The focus of this paper, nevertheless, is on portfolio flows to the CIS, which are less researched (as compared to direct flows), yet are not a less important component of capital flows. Although short-term capital flows might have a destabilising impact on the economy (as in the case of the Asian crisis), the benefits of the influx of foreign capital are also numerous. Fortunately, the portfolio flows into the CIS have picked up considerably since 2005, launching a healthier trend in the region. Nevertheless, the CIS economies are still highly vulnerable to sudden changes in investors' sentiments. An abrupt withdrawal of capital from the region may bring severe consequences to the emerging CIS markets given the small relative size of all CIS economies (excluding Russia) coupled with low market capitalization. Hypothetically, the consequences of capital withdrawal could be even more severe than those that occurred late in 1998, as financial sectors now account for larger portions of the respective economies. Therefore, it is of vital importance to understand what guides portfolio investors, as well as the corresponding risks, if any, faced by the host economies.

Consequently, the main goal of this research is to identify factors which drive portfolio flows in the CIS countries, as well as to assess their relative importance. In studies on developing countries, the authors typically include a wide range of possible explanatory variables which are assumed to be important for portfolio flows (Garibaldi et al, 2001). However, this research uses a more concise set of factors. According to the standard Tobin-Markowitz framework, the determinants of portfolio inflows may be divided into four broad categories (Calderon, Loayza and Serven, 2003): (i) investment return in home country relative to abroad, (ii) perceived risk of

[1] World Economic Outlook: a survey by the staff of the International Monetary Fund, September 2006, IMF.

investments, (iii) degree of co-movement between international returns (which sometimes may take the form of a contagion effect), and (iv) diversification motive. While being short, this set of factors will enable us to produce a comprehensive analysis of determinants of portfolio flows in the CIS.

Equivalently, these determinants may be grouped into global and country-specific factors. The relative importance of these determinants is an important indicator for policy decision making. Specifically, the sensitivity of portfolio flows to external factors will indicate the vulnerability of the CIS economies to global capital market developments. If this reliance is high, shocks in the world financial markets will require an appropriate adjustment plan to be developed in order to keep the target economic indicators within their ranges. At the same time, higher independence of a country from global financial swings will point towards strong domestic fundamentals and sound economic policy.

Special attention in this paper is paid to contagion effects, as their significance was evident in the aftermath of the Russian crisis of 1998. Given that the CIS region is still closely integrated (as can be seen from individual countries' growth patterns), we need to be able to better understand the potential impact of regional contagion on portfolio investment. Hence, the paper tests for the possibility of contagion effects by considering trade-related contagion channels and channels based on macroeconomic similarities between the countries.

Apart from the above-mentioned objectives, this paper enlarges the existing body of research on the determinants of portfolio investment in developing countries (as most of the attention of empirical literature on capital flows is largely devoted to developed countries). In the developed countries setting, scholars have been focusing on either optimal portfolio theory, in which the return and risk were the main factors determining allocation of portfolio flows (Grubel, 1968), or the stock-equilibrium approach (Miller and Whitman, 1970; Kreicher, 1981), which assumes that there exists an optimal allocation of portfolio flows among countries and that actual flows reflect adjustment to the equilibrium.

In the context of developing countries, however, much of the attention is devoted to the analysis of capital flows during the currency crises. Calvo (1993) launched an exploration of determinants responsible for capital flows into developing countries, while Chuhan, Claessens and Mamingi (1993) split the determinants of short-term capital flows in the developing countries into domestic and external, or global. However, there is still no empirical agreement with respect to the relative significance of domestic and global factors for capital flows into developing countries. Unsurprisingly, different factors come into play in various country/time contexts. For example, in the CIS countries, portfolio flows have been identified as moving in accordance with a limited number of factors, e.g. LIBOR and foreign currency reserves (Claessens, Oks, Polastri, 1998; Garibaldi, Mora, Sahay and Zettlemeyer, 2001).

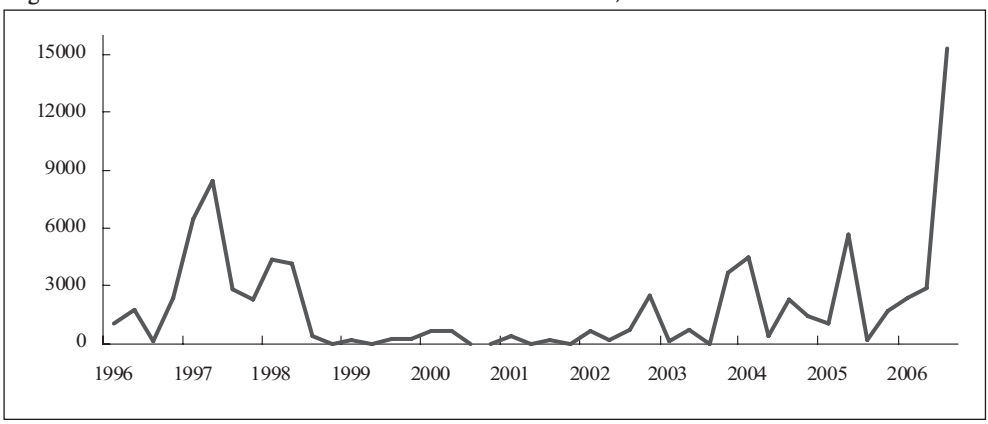
As a result, this paper not only contributes to our understanding of portfolio investment in the CIS countries, but it is also set to offer some insights in a broader, developing countries context in a non-currency crisis setting.

The paper is organized in the following way. We begin by giving a brief overview of the capital flows into the CIS region after the break-up of the Soviet Union. Then we discuss theoretical and empirical work devoted to the analysis of capital flows in the context of developed and developing/emerging economies. Later, we present the methods we use in our analysis, followed by a discussion of the data employed. Econometric results are presented in the subsequent section, which are discussed in more detail in the final section. Some concluding remarks close the study.

1. Portfolio Investment Flows in the CIS

Since the breakdown of the Soviet Union and the beginning of integration with the global economy, the CIS countries have experienced swings in their short-term foreign capital flows. While the period from the mid-1990s to 1998 can be characterized by a net capital inflow, the Russian financial crisis that quickly spilled over to neighbouring countries significantly altered the overall pattern. Capital flight had persisted for a few years and the CIS countries were cut-off from foreign resources for some time. However, following strong growth in the CIS region and further development of its financial markets, portfolio capital flows slowly began picking up in 2002 (please see Figure 1).

Figure 1. Portfolio investment inflows in the CIS countries, million USD



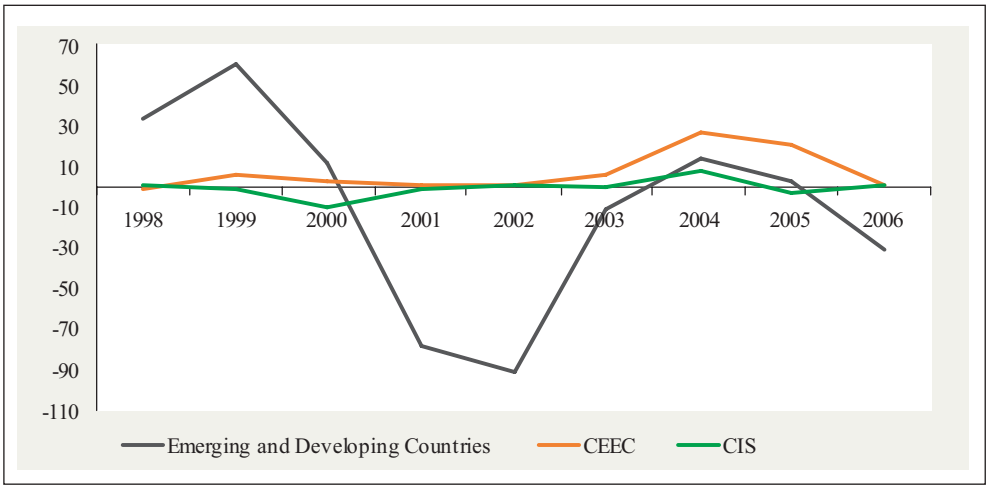
Source: International Financial Statistics.

At the beginning of the 1990s, official capital flows were crucial for CIS development, whereas the volume of private investments was negligible. Official capital flows were primarily the result of borrowing from international financial institutions (e.g. the IMF and World Bank) and were aimed to assist the CIS countries in reforming their economies.

The major obstacles to portfolio flows in the CIS region were as follows: underdeveloped financial systems, poor protection of property rights, capital account restrictions, and lack of reliable financial instruments for foreign investors to invest in. Portfolio flows began to increase once some basic financial institutions and legislative systems were put in place (see Figure 2). First, the bond market began developing (government borrowings and later corporate borrowing), followed by the developing of the stock market.

National stock exchanges in the CIS were created in the second half of the 1990s. The Russian stock market index RTS was launched in September of 1995, while the corresponding Ukrainian equivalent (PFTS) was brought into existence in November 1997. Still, despite the creation of stock exchanges, the equity flows into the CIS were extremely small, particularly due to the underdeveloped financial markets and dominance of the banking sector among other financial institutions. Equity flows increased considerably in 2005-2006. Beginning in the first quarter of 2005 and until the third quarter of 2006, total equity liabilities of CIS countries were augmented by USD 10bn, while debt liabilities grew by USD 6bn. Almost all equity flows into the CIS from 2005-2006 were directed to Russia. The share directed to other CIS countries was minor and amounted to only 0.7% of the total flows.

Figure 2. Private Portfolio flows to Emerging Markets and Developing Countries, USD bn



Source: International Financial Statistics.

The total amount of capital inflows into the CIS economies since the beginning of 1995 and until the first half of 2006 adds up to a sizeable USD 83.2bn, which, however, falls short of the capital inflows into other Central and Eastern European countries. Figure 2 offers a comparison of portfolio flows to Central and Eastern European countries, the CIS, and other emerging markets in the after-crises period (1998-2006).

Unsurprisingly, Kazakhstan, Russia and Ukraine account for almost all portfolio flows into the CIS region, with Russia standing out considerably (see Figure 3). Given that these countries are the largest economies in the region, with Russia and Kazakhstan enjoying considerable endowments of natural resources, their lead in attracting capital inflows is in line with conventional logic. The relative weight of other CIS members has been very small.

Figure 3. Portfolio flows to CIS countries, million USD

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Armenia	7.2	15.9	-16.6	1.6	0.3	0.0	-1.9	0.2	-2.4	1.1	9.3
Belarus	3.2	41.8	-13.4	-5.2	50.1	-45.4	-6.7	5.3	59.6	-38.6	-25.1
Georgia	n.a.	2.4	0.0	6.2	2.7	2.9	0.0	1.0	13.1	15.6	3.6
Kazakhstan	223.5	405.4	66.2	-39.9	30.4	31.4	-182.9	182.1	675.0	1225.0	578.7
Kyrgyzstan	-1.8	5.0	-4.1	0.2	0.3	0.0	-9.5	5.0	0.0	0.0	n.a.
Moldova	30.8	18.6	-59.1	-7.3	-4.0	-3.9	-25.9	-24.2	-8.3	-5.8	-1.5
Russia	4584.0	17794.5	6293.3	-1882.0	-12808.4	-730.0	3756.1	-2328.6	4406.2	-828.0	12272.2
Ukraine	199.0	1605.0	-1379.0	-75.0	-197.0	-867.0	-1718.0	-923.0	2073.0	2757.0	102.0

Source: International Financial Statistics.

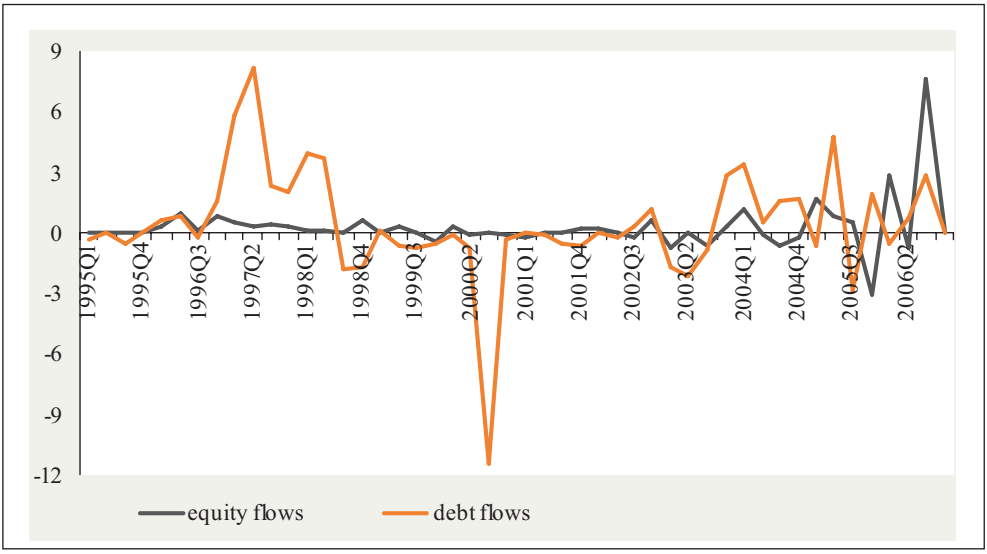
When describing the evolution of portfolio flows into the CIS, three distinct time periods may be distinguished: 1) 1996 up to the Russian currency crisis (3Q1998) -- period of large portfolio inflows, mainly debt; 2) 3Q1998 up to 3Q2003 – no significant capital inflows took place; and 3) 2004 to the present - equity flows have grown in significance. We shall discuss these three periods consecutively.

1.1. Portfolio Flows: 1996 until the Russian crisis (3Q1998)

The first period was marked by impressive debt inflows. The equity flows were tiny since the stock market activity had only just been launched (see Figure 4). The overall amount of debt flows into the CIS during the period up to the third quarter of 1998 amounted to USD 28.8 billion[2]. Unsurprisingly, the majority of capital flowed to Russia. The share of all CIS countries, excluding Russia, constituted only 5.7%; whereas the relative size of the respective economies (measured by GDP ratios) was 19.6%.

[2] International Financial Statistics.

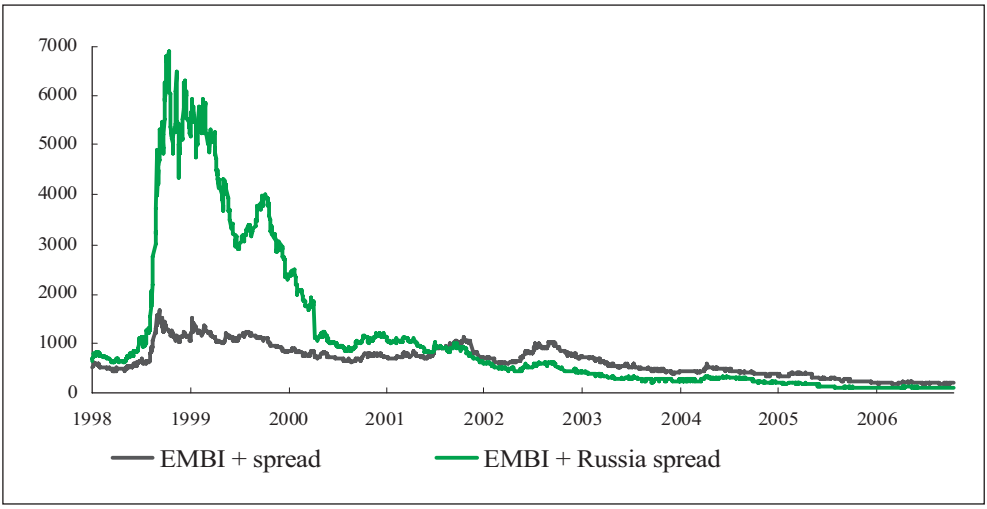
Figure 4. Debt and Equity Flows into the CIS countries, billion USD



Source: International Financial Statistics.

During the period directly prior to the crisis of 1998, return on investment in the CIS countries was huge when compared with other developing countries. Russian T-bills were offering an average yield of 50.4%. Yield on T-bills in Kazakhstan equalled 23.3% on average. Consequently, the excessive volumes of portfolio flows were directed into government bonds. The remarkably high rate of return on investment in the CIS was the principal factor responsible for debt inflows before the crisis. The risk

Figure 5. EMBI+ indices for Emerging Markets and Russia, 1998-2006



Source: www.cbonds.info

premium on the total number of traded Russian external debt instruments measured by EMBI+ Russia spread[3] rose to 44.2% by the end of 2Q1998 from 6.6% in the very beginning of 1998 (See Figure 5). Such a dramatic increase of the EMBI+ Russia spread index was a clear signal of a forthcoming crisis.

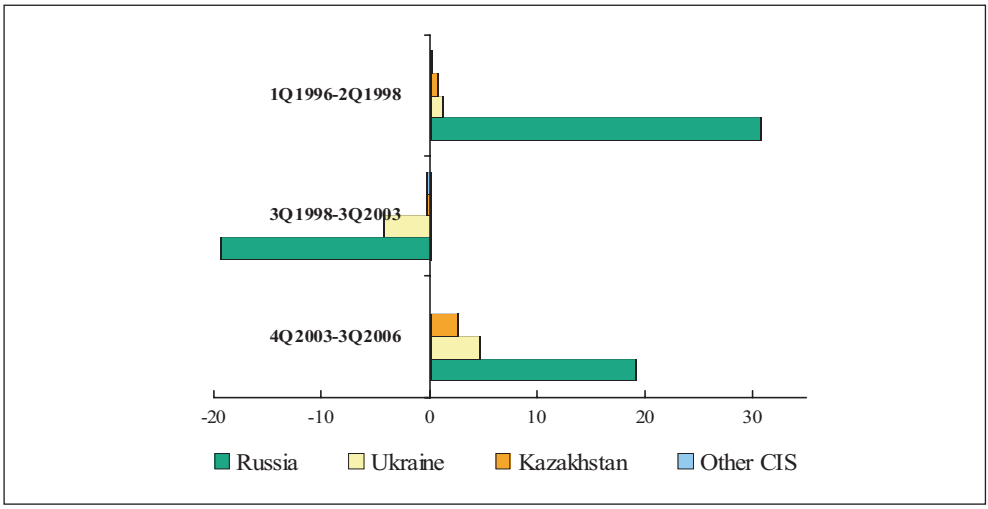
A major share of capital inflows was used for government consumption, which had increased substantially. The Russian quarterly budget deficit during 1Q1995-2Q1998 peaked at 6.2% of nominal GDP on average. Disorderly government expenditures undermined the creditworthiness of the external government borrowings. The budget deficit was one of the factors that triggered the crisis in 1998.

1.2. Portfolio Flows: 3Q1998-3Q2003

The period of capital influx in the first time period considered was reversed by persistent capital outflows after the 1998 crisis. For almost five years, the CIS countries were cut off from external financing. The yield on debt instruments skyrocketed. The index EMBI + Russia spread surged to 6890 points in October, 1998 (See Figure 5). Obviously, no considerable external borrowings were possible under such circumstances.

Although it was only the Russian Federation which defaulted on its external government debt obligations, all other CIS countries experienced disruptive

Figure 6. Accumulated portfolio capital flows in the CIS, billion USD



Source: International Financial Statistics

[3] The EMBI+ index measures the spread of the bonds yield on the traded external debt instruments of the emerging markets and the yield on risk-less US government debt securities.

consequences of the crisis. The accumulated volume of outflows from the CIS countries (except Russia), during the second time period, totalled USD 4.8bn (See Figure 6). Ukrainian capital outflow was the highest among the remaining CIS countries. Besides, as in the period up to the crisis, the equity flows in the second time period were quite modest with no significant inflows having been observed.

Despite its disruptive effects, the Russian crisis motivated major improvements in public finances in the CIS countries. The Russian quarterly budget deficit shrank to 1.3% of nominal GDP on average in 1999 and became positive in 2000. In Ukraine, the budget was nearly balanced in 1999, as well as in 2000.

Since the crisis, the rate of return on government securities has declined dramatically. The yield on T-bills fell to 4.3% in 3Q2003, from 89.6% in 1Q1996, in Russia and to 5.9% from 40.3% in Kazakhstan. The creditworthiness of the CIS external debt borrowings experienced significant improvements. The EMBI+ spread index for Russia and Ukraine declined to 277 points and 255 points respectively. Furthermore, the spread on external debt instruments for Russia and Ukraine had become smaller than the overall EMBI+ spread (which comprises the emerging markets and developing countries).

1.3. Portfolio Flows: 4Q2003-3Q2006

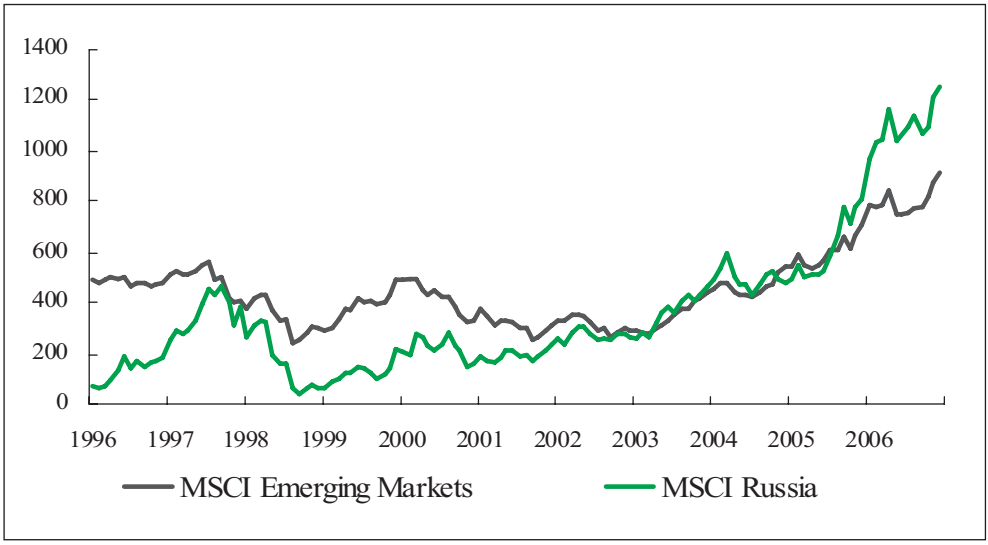
The third time period can be roughly distinguished beginning from the substantial portfolio capital influx in the fourth quarter of 2003, which was followed by a year and a half of persistent inflows. The equity flows gained considerable importance in this period. Although the volume of accumulated debt flows was still larger, the equity flows showed great potential for growth.

The CIS stock market activity experienced impressive growth records. The MSCI Russia equity index[4] grew by 69.5% in 2005 (See Figure 7). The Russian stock market performance over 2005-2006 significantly outpaced the average performance of emerging markets. The same can be ascribed to the stock markets in Ukraine which, however, lagged somewhat in development as compared to Russia. In 2005. the Ukrainian stock market index PFTS grew up by 35.7%.

The stock market development in the third period considered was greatly enhanced by a number of IPO (initial public offering) deals conducted in Russia, as well as other CIS countries. The IPO process in the CIS was launched in 1996 when the first deal came through. However, only since 2005 have initial public offerings increased significantly in volume. During 1996-2004 only seven companies went public in Russia and raised USD 1.1bn. Yet, 2005 witnessed nine IPOs of Russian

[4] For index description see http://www.mscibarra.com

Figure 7. MSCI indices: Emerging Markets and Russia, 1996-2006



Source: www.mscibarra.com

companies, which raised USD 4.6bn. In Kazakhstan and Ukraine, the funds attracted by means of IPOs in 2005 stood at USD 1.4bn and USD 0.15bn respectively. Furthermore, in 2006 the IPO market in the CIS showed tremendous growth. The IPO of "Rosneft" in July 2006 resulted in USD 10.4bn of capital raised. The total amount of IPO deals conducted in Kazakhstan and Ukraine in 2006 amounted to USD 4.6bn and USD 30.6mn respectively.

A number of previously conducted IPO deals of CIS companies are bound to stimulate further expansion of stock market activity in the CIS. Furthermore, the IPO market is expected to preserve impressive growth henceforth. The increase of volume of outstanding shares is expected to lessen overall risks and liquidity risk in particular. However, portfolio flows into the CIS are still projected to be volatile and highly dependent on the IPOs of large companies. Besides, as long as there is little progress with major economic and political reforms (e.g. further liberalization of the economy and capital account, property rights protection, improvement of legal system), the portfolio flows into the CIS are likely to be highly susceptible to global financial sentiments.

2. Literature Review

The existing literature on portfolio flows may be divided into two broad categories. The first group looks at portfolio flows in developed countries. This part of the

literature analyzes portfolio capital flows in the context of the portfolio equilibrium framework. The second group focuses on portfolio flows into the developing countries. Scholarly interest in this area was revived following a series of currency crises, which hit a number of emerging markets in the 1990s. These studies pay special attention to external (push) and domestic (pull) determinants of capital flows. The following section provides an overview of research on the topic, whereas Annex 1 provides a more detailed account of the studies discussed below.

2.1 Capital flows in the developed countries

One of the most popular approaches used to analyse international capital movements is the stock-equilibrium model developed by Miller and Whitman (1970). The authors treat capital flows as a combination of stock adjustment and flow adjustment components. Based on U.S. quarterly data, they show interest rate differentials to be highly important determinants of international capital movements. The speed of adjustment coefficient suggests that approximately 1/3 of adjustment between foreign and domestic assets holdings takes place within one quarter.

The same approach was also used by Kreicher (1981). However, his model assumes that there is some desired stock of capital that economic agents would like to have. However, as the actual stock differs from the desired stock, it induces investments to flow. The author argues that the desired stock of capital depends on a set of country specific variables (such as real interest rate and industrial production indices). The model was estimated for both capital inflows (liability equation) and outflows (asset equation) for four developed countries. Industrial production indices were found to be statistically insignificant in all of the asset flow equations; however, they are statistically significant in the liability equations. For all countries there is at least one real interest rate being statistically significant. Hence, an increase in the external market return leads to an increase in portfolio flows into the country. However, the domestic real interest rate turned out to be statistically significant for only two countries, which suggests some independence in investment decisions concerning capital allocation between the domestic economy and the rest of the world.

Further, development to the stock equilibrium approach was undertaken by Kouri and Porter (1974), who combined the stock equilibrium approach with balance-of-payments theory. The authors assume the capital flows to be the means for eliminating excess money demand. Thus, it is believed that income and interest rates should have a significant impact on capital flows. The authors find that the primary motive for capital flows is real disposable income which, in turn, is an important determinant of money demand. Therefore, they conclude that money demand and supply forces determine the capital flows between countries.

The next important approach in the analysis of international capital movements is the portfolio equilibrium approach. It is often regarded as more suitable for estimation of portfolio flows because it captures the effect of the two most important factors, such as market return and risks associated with investments (Kraay et. al., 2000).

A complication to the portfolio equilibrium models arises when informational asymmetries between international investors are taken into account (Brennan and Cao, 1997). In this case, investors may not act in line with portfolio equilibrium theory logic. Brennan and Cao (1997) developed a model of international capital flows based on the differences in knowledge about foreign markets. The authors moved away from barriers to investments, and interest rate differentials. The only independent variables that enter the equation are market returns and foreign market indices measured in US dollars. The authors conclude that while US investors have an informational disadvantage in the foreign market (apart from the UK), investors from developed and developing countries do not have any informational shortages in the US market.

Brennan and Cao's (1997) informational disadvantages hypothesis found little support in the study by Froot, O'Connell and Seasholes (1998). High frequency data employed in the paper allowed for a more comprehensive analysis of portfolio flows. Daily international portfolio flows for 46 countries were used to estimate a structural equation by employing the vector auto-regression (VAR) methodology. It was found that portfolio flows had been highly persistent over time. For developing countries, current portfolio inflows are good predictors of future returns. However, for developed economies, this is not the case. Thus, inflows of capital to emerging markets contain some information about their future value.

Another popular approach for analysis of portfolio flows has been borrowed from international trade theory. More precisely, the gravity model has been successfully employed by, for example, Portes and Rey (1999). An augmented gravity equation produced a very good fit for equity flows into the 14 developed countries. As a measure of market size, Portes and Rey (1999) used market capitalization. To proxy the cost of investing they included a distance variable. The authors found that market returns do not play any significant role in equity flows. Measures of market size and distance were found to be the key determinants of capital flows. Also, the information asymmetry explanation of equity flows found strong support in their results.

Siouronis (2002) employs a similar model to Portes and Rey (1999). Specifically, the author uses the volatility augmented gravity equation model to estimate the influence of monetary variables on the composition of international capital flows. Contrary to Portes and Rey (1999), the distance proxy was found to be an insignificant determinant of cross-border capital flows for developed economies. However, for developing countries, the distance was important in most of the cases. The capital flows were divided into three broad categories: government bonds, corporate bonds and corporate equities. For

all of the capital categories, market interest rate and inflation volatilities were found to be significant with a negative sign. This is in line with the logic that as interest rate and inflation volatility increase, the riskiness of the investments increases as well. Interestingly, exchange rate volatility was found to have a positive impact, i.e. greater volatility of exchange rate encourages all types of capital flows.

While consideration of domestic (or pull) and external (or push) factors is more widely used in literature analysing developing countries, it was also applied in a developed country setting by Odedokun (2003). He used a push and pull factors approach to analyze the determinants of capital flows from the perspective of a capital-exporting country. Per capita income levels, interest rates, economic growth and the phase of the economic cycle are among the key explanatory variables in his study. The author reports a significant and positive effect of income per capita on capital flows. A relatively high interest rate in the destination country pulls the portfolio capital, while the increase of interest rates in other countries tends to discourage capital flows. Economic growth, as well as the economic cycle, appeared to be insignificant factors in explaining capital flows. Thus, the only factors which matter are income and interest rate differentials.

A domestic interest rate has been found to be a significant determinant of portfolio flows into the developed countries by almost all authors. Hence, portfolio investment flows were confirmed to be responsive to the changes in international market returns. Furthermore, gravity models confirmed a positive impact of the market size on portfolio flows, whereas the impact of distance and information cost had not always been found statistically significant.

2.2 Capital flows in the developing countries

There is a significant body of research exploring the determinants of capital flows into the developing/emerging economies. Considerable attention is devoted to the analysis of the causes of different currency crises. The Mexican crisis of 1994 and the Asian crisis of 1997 have spurred substantial interest by economists. Financial crises are typically followed by significant exchange rate depreciation if a floating exchange rate is adopted, or a foreign reserves reduction if it is fixed. However, the Mexican and Asian crises have witnessed both processes. Large IMF loans were used to cover international capital imbalances during those periods.

Carlson and Hernandez (2002) analyzed the major factors that led to financial crises in both regions. While in Mexico the low ratio of short term debt to reserves contributed to crisis aggravation, in Asia, an abrupt debt denomination was a major cause of the crisis. In both cases, composition of capital flows affected the likelihood

of a crisis occurring. A considerable part of capital inflows into these countries was short-term. As economic conditions in the countries began to deteriorate, short-term capital was the first to leave the country. Thus, the government should have implemented some policies to balance the structure of capital flows. For example, by imposing capital controls the government could have increased the level of FDI in the economy and restricted the volume of short-term debt. A floating exchange rate tends to encourage the share of short-term debt, while a fixed exchange rate promotes FDI and portfolio flows. It is generally assumed that portfolio flows behave similarly to short-term debt because of its short-term nature. The authors concluded that portfolio flows behaved similarly to FDI. being encouraged by a fixed exchange rate regime.

The stock adjustment approach employed for developed countries has also been used to investigate portfolio flows into developing countries. Hernandez and Rudolph (1995) employ a stock adjustment model by incorporating push (external) and pull (internal) determinants of capital flows. The estimation results support a proposition that pull factors are of larger importance than push factors for portfolio flows to transition economies. In particular, the 12-month US Treasury bill rate was found to be insignificant. Therefore, the paper infers that an adverse shock is very unlikely to happen solely because of external factors.

The opposite findings have been reported in Fernandez-Arias (1994) where the push explanation of capital flows received greater backing. Fernandez-Arias (1994) developed a model of international capital flows based on non-arbitrage conditions between external and domestic measures of returns adjusted by country risk. Three key variables of the model are the countries' creditworthiness, domestic investment return and opportunity costs represented by market return in developed countries. The results showed a larger influence of the international interest rate on capital inflows into the country than improvements in the domestic investment climate. A country's creditworthiness also appeared to be an important factor driving capital inflows into the country. However, it is argued that creditworthiness is influenced by external sources to some extent. A country's credit rating tends to improve when the international interest rate is low.

The relative importance of push and pull factors in determining capital flows varies by country. While for the CIS countries domestic factors were found to be the major determinants of capital flows (Claessens, Oks and Polastri, 1998), both internal and external factors were found to be important for Latin American and Asian countries (Taylor and Sarno, 1997). The authors use the same monthly data on portfolio flows from the USA to a group of Latin American and Asian countries, as in the study by Chuhan, Claessens and Mamingi (1993). Taylor and Sarno (1997) estimate a seemingly unrelated error correction model to retrieve short-term effects, while cointegration techniques were employed to estimate long-term coefficients.

Both methods testified of approximately equal importance of external and domestic determinants. However, for bond flows, global factors seem to have greater importance than domestic factors.

The proposition that the importance of push and pull factors is equal for emerging economies was challenged in other studies. Hernandez, Mellado and Valdes (2001), which analyzed portfolio flows to developing countries in Latin America, Asia, and Eastern Europe, found that domestic determinants are much more important than external ones. The authors pay special attention to the so-called contagion effect which occurs if capital flows exhibit strong co-movement. In this case, decisions by large investors tend to be followed by many relatively small players whose behaviour mimics the pattern of the leader. Three possible sources of contagion considered in the paper: the neighbourhood effect, the trade related channel and the similar macroeconomic indicators channel. The estimation results provided strong evidence that macroeconomic similarities and trade linkages between countries tended to intensify the impact of external shocks for the countries.

On the other hand, support for pull factors in explaining international capital flows in the developing country setting was offered in a study by Chuhan, Claessens and Mamingi (1993). The authors explored the relative importance of global and domestic determinants of capital flows. They analyzed net equity and gross bond flows from the USA to Latin American and Asian countries. While for Latin American countries the external and domestic factors were roughly equally important, for Asian countries, domestic fundamentals played a larger role. Interestingly, equity flows were shown to be more sensitive to global factors than bond flows.

The pull factor explanation of capital flows has found considerable support in existing literature on developing countries. There is also some evidence for the push factors explanation, although it is far less prevalent. Thus, reforming institutions and strengthening the domestic economic environment are the key factors that should attract capital flows into developing countries.

2.3 Capital flows into the CIS countries

For the CIS countries except Russia, almost all capital flows have taken the form of foreign direct investment (FDI). Out of portfolio investment only, a considerable amount of capital flows took the form of government borrowings from international organizations (mostly from the IMF and the World Bank) both long-term (in order to conduct structural reforms) and short-term (in order to cover rising fiscal deficits).

The studies of the CEE and CIS countries claim that the most important factors of portfolio inflows tend to be domestic. Claessens, Oks and Polastri (1998) concluded

that a country's success in reforms and robust creditworthiness are the only important determinants of capital inflows into the country (having considered a variety of both external and internal factors). It is not surprising as the bulk of capital flows had been in the form of government borrowing to conduct reforms. Thus, the primary goal of the capital inflows was to promote the reform process. Because of the relatively short history of portfolio flows into the CEE and CIS countries, the authors speculate about "weak relationships" in a portfolio flow equation which limits the estimation options.

Another similar study, which analysed the portfolio flows into the CEE and CIS countries, has been conducted by Garibaldi, Mora, Sahay and Zettlemeyer (2001). As in the previous paper, portfolio capital flows have been found to be much harder to properly model than FDI. The authors found only a few explanatory variables to be responsible for portfolio investment into the CIS and CEE. While macroeconomic variables played a significant role for FDI, portfolio investment was found to be associated with developments of financial market infrastructure and protection of property rights only. Hence, such factors as interest rates and solvency indicators were not reported to be among important determinants of portfolio flows into these countries. Hence, again for CEE and CIS countries, domestic factors were shown to be highly important in attracting capital inflows. Large sensitivity of investment to these factors indicates that the CIS countries need to pay considerable attention to the development of a healthy institutional environment.

3. Methodology

According to the Tobin-Markowitz framework, as discussed in Calderon, Loayza, and Serven (2003), the determinants of portfolio flows into a country or a region may be split into four categories:

(i) Expected investment return in host country relative to abroad.

(ii) Perceived risk of investments.

(iii) Co-movement between portfolio flows in given countries.

(iv) Diversification.

This set of comprehensive determinants encompasses the factors which are responsible for portfolio flows to CIS countries. It is also easy to expand this approach to the one most frequently used in the literature on developing countries, specifically, the push-pull framework.

The four above-mentioned groups of portfolio flow determinants are essential in the long-run. In the short-run, additional factors such as frictions and imperfections

of financial (as well as real) markets, and changes in the regulatory framework may play a significant part too. Additionally, co-movement in capital flows over and above a normal level can also be considered as determining portfolio flows in the short-run.

Despite being a widely applied framework, the Tobin-Markowitz approach, however, does not work accurately even for developed countries. Investors usually tend to under-invest in foreign countries even after appropriately adjusting investment decisions by expected risk and return, and also over-invest in the domestic market, thus, causing home bias in portfolio investment (Tesar and Werner, 1995). Investors expect "return in their domestic equity markets to be several hundred basis points higher than returns in other markets" (French and Poterba, 1991).

As for developing countries, a number of other factors play a significant part in addition to the standard ones. One of these factors is restrictions on cross-border capital movements in developing countries which control various aspects of foreign investment. The ease of liquidation of an investment position in the local market tends to be the most important. In the CIS, the controls on capital flows have not been lifted yet. This is definitely one of the reasons for the relatively modest volumes of portfolio flows as compared to direct investment. The issue of capital account liberalization is an acute question for the CIS countries to address. All CIS countries, except for Azerbaijan, experience approximately the same level of capital account restrictions.

Another important factor, which has been shaping the pattern of portfolio flows into the developing/transition economies and the CIS in particular, is a country's political environment. The CIS countries have been characterized by constantly changing political situations, which obviously had a detrimental impact on the investment climate. Hence, it is expected that an improvement in political stability will have a considerable impact on portfolio flows into the CIS.

Underdeveloped financial markets were yet another restricting factor to portfolio flows into the CIS. The set of possible investment opportunities in a typical CIS country was very narrow, mostly represented by debt instruments. Unsurprisingly, the majority of portfolio investment used to be of the debt type. A large part of debt flows were government borrowings. Hence, during the first years of independence, portfolio flows were skewed toward government securities.

Following the approach used in literature on developing countries, in this paper we split the determinants of portfolio flows into the CIS region into two large groups: global or push and domestic or pull factors. This division will help us to differentiate between domestic and global sensitivity of capital flows into the CIS region. Recognising the importance of domestic factors for capital flows into the developing countries and the CIS, we also expect global factors to play a significant part in the CIS setting as was shown by Calvo et al. (1993). In this case, external or global factors

will only be reflecting the return on investment. It is assumed that these investments are risk-free as compared to the investment in the CIS.

As a result, we employ the following external or push factors in this paper:

(i) short-term international interest rate measured by *Market yield on U.S. Treasury securities at 3-month constant maturity*. The correlation of yield on the 3-month US Treasury securities with the Euro-Dollar 3-month deposit rate is close to one. The correlation with yield on the 2-year US Treasury securities is also very high, which justifies the usage of the 3-month US T-bills rate.

(ii) *yield on a world stock market index* measured by S&P 500 (Standard & Poor's 500).

(iii) *yield on emerging markets price index* from Morgan Stanley Capital International (MSCI). This index should reflect more closely the risk structure of investments similar to those in the CIS (i.e. the emerging markets).

(iv) *US real GDP growth,* which is supposed to represent (be correlated with) world economic activity. The inclusion of this global explanatory variable will shed some light on whether portfolio flows to CIS countries follow global economic cycles.

The determinants of portfolio flows considered in this research constitute only a background or approximation to characteristics which are of primary interest to the investor. Largely, these are return and risk measures of investment into a particular asset.

Hence, the following internal pull factors are employed in this study to account for investment opportunities in the host country (CIS):

(i) *domestic deposit rate* (which is a good indicator of prevailing interest rate in a country). In the CIS, the domestic deposit rate is strongly correlated with the T-bill rate (the correlation coefficient equals 0.92 for Russia, and 0.86 for Kazakhstan).

(ii) *real GDP growth rate*.

At the same time, perceived risks of investing into the CIS countries are approximated by several variables. Because the risks in the CIS countries were numerous, a single measure of risk may not provide satisfactory results. The most common risks faced by investors are currency, financial, and political risks. We will assess these risks with the following explanatory variables:

(i) *exchange rate risk will be measured by the percentage change in the exchange rate of the national currency against the US dollar,*

(ii) *financial risk will be estimated by employing corresponding indices* from the International Country Risk Guide (ICRG).

(iii) *political risk will be also approximated by corresponding indices* from the International Country Risk Guide (ICRG).

The ICRG financial risk index is comprised of the following components: foreign debt as a percentage of GDP, foreign debt service as a percentage of exports of goods and services, current account as a percentage of export of goods and services, net international liquidity as month of import cover, and exchange rate stability. The numerical values of the categories are then assigned specific risk points in order to combine them into one index. The index is measured on a scale of 1 to 100, with higher values being assigned to the most stable countries, hence, 100 points indicates an absence of financial risk.

The ICRG political risk index is a weighted average of the values assigned to the following categories (each one assessed independently): government stability, socioeconomic conditions, investment profile, internal and external conflicts, corruption, military in politics, religious tensions, law and order, ethnic tensions, democratic accountability, and bureaucracy quality. The maximum and minimum points of the index are similar to those of the financial index[5].

We have already emphasized the importance of contagion for capital flows. The literature embraces different views with respect to the nature of the contagion effect. While Fiess (2003) does not distinguish contagion from global conditions, Forbes and Rigobon (1999) proposed defining contagion as "a significant increase in cross-market linkages after a shock". In this paper, we will follow the approach introduced by Forbes and Rigobon (1999). Specifically, they propose the use of the term 'shift-contagion' rather than 'contagion'. Naturally, the Russian financial crisis of 1998 will be investigated as a source of shift-contagion in the CIS countries. A test on stability of the effects of push and pull factors before and after the crisis will help to analyse the presence of the contagion after the crisis period. The analysis of the two time periods, before the crisis of 1998 and afterwards, will also help to better understand the influence of the factors outlined above on portfolio flows into the CIS. The behaviour of the domestic variables differs substantially before and after the crisis, which prompts the hypothesis that there was a significant (structural) change in the relationship between explanatory and dependent variables in 1998.

Although Forbes and Rigobon (1999) introduced a more sophisticated way to account for contagion effects through the use of unconditional correlation coefficients, it does not seem possible to apply in this paper due to the low frequency of data on portfolio flows in the CIS (in this case, a correlation coefficient for the period before the crisis of 1998 will offer little insights).

Apart from the contagion effects, the literature also suggests being aware of the presence of co-movements in the flows of capital to adjacent regions. To account for this effect, we include portfolio investment flows to Central and Eastern European

[5] For more information on ICRG methodology please see http://www.prsgroup.com/ICRG_Methodology.aspx

countries as an additional explanatory variable. Furthermore, in line with the Tobin-Markowitz model, we test for a diversification motive in the CIS region through inclusion of a country's GDP share in the total GDP of the CIS countries.

Another factor that is hypothesised to have a significant impact on short-term capital flows is capital account controls in the CIS. It is very important since capital account restrictions are present in almost all CIS countries except Armenia. However, we were not able to construct an appropriate index due to low variation in the data for the CIS countries (both across time and cross-sectional). There are plenty of controls imposed on transactions with capital market securities and money market securities which are still not abolished in the CIS[6]. Yet, it will only be possible to assess the effect of these restrictions when more countries start relaxing at least some of them.

The determinants of portfolio flows to the CIS countries will be estimated using a panel data regression. Using either the fixed or random effect method (as will be suggested by the Hausman specification test), the following model will be estimated:

$$PIL_{it} = \alpha + \beta_{1k} WR_{k,it} + \beta_{2j} DR_{j,it} + \beta_{3s} RI_{s,it} + \beta_4 CO_{it} + \beta_5 D_{it} + \varepsilon_{it},$$

where PIL_{it} is portfolio investment liabilities in USD, mn; $WR_{k,it}$ – is a set of global variables which measure return on investment in global markets. In particular, they encompass the 3 month U.S. T-bills yield, MSCI emerging markets yield, S&P 500 yield, and the US GDP growth rate. $DR_{j,it}$ – is a set of variables measuring domestic return on investment, which comprise the domestic deposit and GDP growth rates. $RI_{j,it}$ – is a set of risk variables, comprised of the exchange rate changes, financial and political risk indexes; CO_{it} – a co-movement variable, operationalised by portfolio investment flows to the CEEC[7]; D_{it} – a diversification variable measured by a country's GDP share in the total GDP of the CIS countries, ε_{it} – stochastic error term distributed as $N(0,\sigma^2)$.

4. Data

The time span of balance of payments data on the CIS members[8] is rather short (if available at all) and that determined the time dimension of the sample under

[6] See 'Annual Report on Exchange Arrangements and Exchange Restrictions', the International Monetary Fund.
[7] Central and Eastern European Countries (CEEC) in this research comprises the following countries: Bulgaria, Czech Republic, Hungary, Poland, Romania, and Slovakia.
[8] CIS includes the following countries: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Ukraine and Uzbekistan. Turkmenistan suspended participation in the CIS in 2005.

consideration. More specifically, the data is available beginning in the first quarter of 1996 and ending in the second quarter of 2006.

The primary source of data is the International Financial Statistics (IFS) of the IMF. However, the IFS do not provide data on all countries that are members of the CIS. In particular, the data for Uzbekistan are not available in the IFS database at all, whereas the data on Tajikistan contain a highly limited number of series, which makes them of no value for the purposes of this research. Hence, these countries will not be considered in this paper. Also, the two Caucasus countries – Azerbaijan and Georgia –are not included in the sample either. A number of series are unavailable for Azerbaijan, whereas portfolio flows to Georgia have very often been reported to be zero in magnitude. In the end, the final sample comprises the following countries: Armenia, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia and Ukraine.

We use quarterly portfolio investment liabilities[9] (which consist of the claims of foreigners on assets in the CIS) as a dependent variable in this paper. Quarterly series is the most frequent data format available for the CIS countries that defines the frequency of the sample under study. Table 1 offers a more detailed description of variables and corresponding sources; whereas Appendix 2 provides summary statistics and graphs.

5. Results

We employ a random effect Generalized Least Squares technique (with a correction for cross-country heteroskedasticity) to analyse the determinants of portfolio flows into the CIS countries. The choice of the random effect technique was supported by the Hausman specification test which rejected the use of a fixed effects model. The fixed effects technique produces inefficient estimates when no correlation between fixed effects and regressors are observed in the model. The random effects model, on the other hand, supplies lower estimates of the standard errors, hence, more precise inferences can be made. The use of a random effects model for the CIS indicates that specific individual effects of each country are the realization of random processes and constitute individually specific errors. The results are quite natural given the common past of the CIS member countries and that they all had approximately the same level of economic development during the time period studied.

[9] Portfolio investments are divided into debt and equity securities. Debt securities are subdivided into bonds and notes, money market instruments, and financial derivatives. Equity securities include shares, stocks, participation, preferred stocks or shares, mutual funds, and investment trusts.

Table 2 reports estimation results of the determinants of portfolio flows into the CIS countries. The estimates obtained are generally consistent with the theory of allocation of international portfolio flows. Higher return in the host country attracts more portfolio investment to the CIS countries, whereas higher risk (particularly political risk) has a detrimental effect on the investment attractiveness of the region. We also found empirical support of co-movement between portfolio flows into the CIS and CEE regions. Additionally, the size of the economy has been confirmed to induce portfolio flows to the CIS countries.

The following discussion of the results is organised according to the 4 categories of the Tobin-Markowitz framework on which we have based our analysis, i.e. relative return, risk, co-movement and diversification. As has been mentioned before, we have employed the following measures of the relative return: global and domestic GDP growth rates, the US T-bill yield, MSCI emerging markets yield, domestic interest rate and the S&P 500 yield.

Portfolio flows to the CIS countries were found to be independent of global economic cycles and, to some extent, from domestic ones. The world economic cycles (as approximated by seasonally adjusted US GDP growth rate) do not have a statistically significant impact on portfolio investment in the CIS (see Table 2).

However, the impact of domestic economic activity (as measured by a host country's growth rate) changes over the period under consideration. Despite the variable being insignificant over the whole time period, it becomes significant only if an after-crisis period is considered. Before 1998, the GDP in the majority of CIS countries was declining, yet large portfolio (debt) inflows were reported. The situation reversed after the Russian default in 1998: both GDP and capital flows were growing shortly thereafter. Unsurprisingly, no relationship could be detected over the whole time period. Yet, domestic GDP growth rate turns out to be statistically significant at the 10% significance level after 1998. Consequently, portfolio flows in the after-crisis period have become sensitive to domestic economic activity which indicates a structural shift in the pattern of capital flows into the CIS.

The Russian crisis has also had a significant impact on the relationship between another measure of return on investment, the interest (deposit) rate in the CIS countries and capital flows. Despite its significance in the baseline specification, the coefficient loses its significance when the influence of the 1998 crisis is accounted for (See Table 2). This suggests that the crisis of 1998 had a crucial impact on the relationship between the deposit rate and portfolio flows into the CIS. Our estimates show that the influence of the deposit rate has changed over time. While for the period before the Russian default, the coefficient of the deposit rate is significant at the 5% significance level and negative (a higher interest rate in that period was a reflection of high domestic inflation and risk, rather than higher return on investment); the

coefficient changes the sign to positive and becomes significant at the 1% level after the crisis (see Table 2). Before the crisis, a decline in the deposit rate meant not lower profits, but higher macroeconomic stability and lower risks in a country. The largest value for the deposit rate in CIS countries during 1996-2006 was 61.7%, whereas the mean value is only 16%. After the crisis, the deposit rate has become more stable and its influence on portfolio flows has become more predictable.

The world interest rate, measured by US 3 month T-bill yield, did not appear to be a significant determinant of portfolio flows into the CIS.

Another measure of the relative return considered in this study is the yield on the S&P 500. The return on the global stock market is only important for equity flows which have been small in the CIS as compared to debt flows. But nevertheless, the coefficient of yield on the S&P500 is statistically significant and positive (see Table 2). As mentioned above, measures of relative return and the influence of S&P 500 return on portfolio flows have seen a considerable change in the aftermath of the Russian crisis. Specifically, the magnitude of the coefficient declined strongly, though, remained positive (Table 2). A positive relationship between S&P 500 yield and portfolio flows to the CIS signals a larger willingness to invest in emerging markets when more liquidity in the developed markets is available. In this case, investment into the CIS is deemed complementary to investment in the global stock markets.

However, we find investment into stock markets in the emerging markets acts as a substitute to investment in the CIS (if measured by the yield on the emerging markets index (MSCI)). In a baseline scenario, the coefficient on the MSCI index turns out to be significant with a negative sign, indicating a substitution effect. However, after inclusion of the dummy for the Russian crisis, the coefficient becomes insignificant as the index (which was severely hit by the Asian/Russian crises) has the same structure as the dummy. Therefore, we excluded it from specifications 2-4 to avoid potential multicollinearity.

Of the risk measures considered in this research, only political risk is statistically significant and a robust determinant of portfolio flows. The other two risk variables, financial risk and exchange rate risk, were found to be insignificant. Exchange rate risk, which is essentially the risk of depreciation of the national currency, becomes significant at the 10% level when a group of larger CIS countries is considered separately. We have already mentioned that political risk was found to be the most significant risk variable. However, the value of the coefficient has declined considerably since the Russian default in 1998 (See Table 3).

There is strong evidence of co-movement in portfolio flows between the CIS and CEE countries. The coefficients for portfolio flows into the CEE countries remain significant and positive in all specifications under consideration. Hence, investment

into the CEEC and CIS are deemed complementary: the more capital flows into the CEE countries are recorded, the more likely capital is to flow into the CIS as well.

The diversification motive measured as the ratio of a host country's GDP in total GDP of CIS countries has also been reported to have a significant positive effect on the portfolio flows in the CIS. The value of the coefficient declined strongly after the crisis of 1998 (see Table 2). However, it remained positive, which means that investors tend to invest in larger CIS economies even after controlling for all other determinants.

One of the most robust findings of this analysis is the significance of the Russian 1998 crisis for the capital flows into the region. A dummy variable which controls for the effect of the crisis was statistically significant at the 1% level in all specifications. Unsurprisingly, it had a negative sign. Furthermore, as was mentioned earlier, the stability tests performed indicate a structural break, with many variables behaving differently in the periods before and after the crisis.

Three countries out of all CIS countries are responsible for almost all portfolio flows into the CIS region. These countries are Kazakhstan, Russia, and Ukraine. Furthermore, among these countries, Russia stands out considerably. The results for the group of larger countries (the three mentioned above) show a larger importance of external factors (see Table 2). Specifically, these are yields on the S&P 500 and portfolio flows into the CEEC. Also, the Russian default dummy is found again to be a strong determinant. The impact of the deposit rate is similar to its impact in the full sample. On the contrary, for a group of other CIS countries (smaller countries), domestic variables play a greater role as compared to external variables.

6. Discussion

The Russian crisis of 1998 has had the largest influence on capital flows into the CIS countries. It is the most statistically robust and significant variable among all other determinants of portfolio flows considered in this study. The crisis has re-shaped the pattern of portfolio flows into the CIS countries in subsequent years. Prior to 2002, the CIS had been primarily experiencing net outflows of capital. According to our estimates, the Russian default of 1998 was responsible for the outflow of portfolio capital from the three largest CIS countries in the amount of USD 2.7bn (see Table 2). For the CIS as a whole, the influence of the Russian default on portfolio flows is somewhat smaller and constitutes only USD 1.7bn (in outflows). The relatively low impact of the crisis in the whole CIS setting is due to the much smaller volumes of portfolio investment into smaller CIS countries before 1998.

The portfolio investment flows to the CIS move together with the flows into Central and Eastern European countries. Specifically, an increase in portfolio flows to the CEEC by USD 1mn induces an inflow of capital to the CIS region of USD 0.07mn (Table 2). Though the impact of co-movement is small, it is robust to the inclusion of other explanatory variables.

The impact of variables measuring the relative return in the CIS with respect to the return abroad has a mixed pattern. The return variables have a different influence on portfolio flows before and after the Russian crisis. Interestingly, before the crisis, lower domestic interest rates tended to increase portfolio inflows. From 1996-1998, due to large risks in the CIS, interest/deposit rates were high. Thus, a decrease in the interest rate signified lower investment risks in the country, which had a positive effect on portfolio flows. When, after the crisis, interest rates generally decreased, their magnitude began to positively influence inflows of short-term capital. In particular, before the Russian crisis, a decrease in the deposit rate by 1% was followed by an increase in portfolio flows by USD 33.8mn; whereas after the default, an increase in the deposit rate by 1% was causing portfolio flows to rise by USD 30mn (see Table 2).

Though most of portfolio flows into the CIS countries were of a debt type, the S&P 500 was found to be an important determinant of portfolio flows into the region as well. A growth in the S&P 500 by 1% has been causing the portfolio investment liabilities to increase by USD 4.9mn in the after-default period (see Table 2). The positive sign of the coefficient points to the complementarity of portfolio flows in the CIS and world stock market activity.

Expectedly, the most important risk determinant of portfolio flows into the CIS region is political risk. The employed ICRG political risk index measures not only stability of a country's political environment but also the quality of bureaucracy, law and order, corruption level etc. Hence, portfolio flows to the CIS are more sensitive to the quality of institutions rather than to a country's creditworthiness measured by ICRG financial risk index (which appeared to be insignificant). An increase in the political risk index by 1% has been estimated to increase portfolio flows into the CIS by USD 24.7mn on average (see Table 2).

7. Conclusions

This paper has been devoted to the analysis of the determinants of capital flows into the CIS countries. Taking the Tobin-Markowitz framework as a basis, we have analysed the impact of global, domestic, co-movement and diversification factors on the capital flows into the region.

The Russian crisis of 1998 has had the most considerable impact on portfolio flows into the CIS countries. It had influenced portfolio flows directly and indirectly, through its effect on other related factors. The behaviour of a number of capital flow determinants into the CIS changes significantly before and after the crisis of 1998. In particular, an important determinant of portfolio flows – the domestic interest (deposit) rate – has undergone serious changes in the aftermath of the Russian financial crisis. Having had a negative impact on portfolio flows into the CIS before default, it has changed its impact to positive after the crisis.

Political stability is the second most important determinant of portfolio investment into the CIS. Apart from political risk, the employed ICRG political risk index also assesses the quality of institutions in a host country. Hence, the quality of institutions was shown to shape considerably the attractiveness of the CIS region for private investors.

Another interesting finding is that a growth in portfolio flows to Central and Eastern European countries (which are now members of the EU) seems to have also enhanced capital flows to the CIS. It is likely that some investors expect the CIS countries to a have economic performances similar to the CEECs. Though the coefficient measuring this influence is small, it is robust to the inclusion of other explanatory variables.

Our results also have implications for domestic economic policies in the CIS countries. As investors tend to link the actual investment with the performance of the country (as opposed to the pre-1998 period), the inadequate macro policies may transmit faster into sudden capital flight in the case of bad economic policies. As we have already mentioned, the consequences for the economy in general and the financial sector, in particular, may be even more pronounced than in 1998-1999.

However, there is also another, more positive side to the story. It is the fact that institutional investors tend to notice positive domestic developments in the CIS region, and tend to react to them. Hence, if the CIS countries continue to grow, reform and integrate with global trading blocks, short term capital is expected to flow, thus contributing to the development of domestic financial markets. Large inflows usually also mean that financing of the budget deficits can become cheaper over time.

From this perspective, a significant increase in capital inflows into the region is expected in the future. If positive economic developments in the CIS region are accompanied by lowering/abolishing the restrictions on the current account, persistent reform of domestic financial sectors and further integration with the global economy, an upsurge in capital flows into the region is anticipated to be of a much higher magnitude.

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Table 1. Description of Explanatory Variables

Variable	Operationalization	Data source	Label
External explanatory variables			
Market yield on U.S. Treasury securities at 3-month constant maturity, quoted on investment basis	Average yield over quarter, %	Federal Reserve Board, Statistics: Releases and Historical Data, (www.federalreserve.org)	US T-bills yield
Yield on US stock market index, S&P 500	Yield on S&P 500 over the quarter, %	http://finance.yahoo.com	S&P 500 yield
Yield on Emerging Markets Price Index	Average yield on MSCI EM Price Index over quarter, %	MSCI Barra, (http://www.mscibarra.com)	EM Prices index
US Real GDP growth	US GDP percent change based on chained 2000 dollars (seasonally adjusted growth rates), %	Bureau of Economic Analysis, (http://www.bea.gov)	US GDP growth
Portfolio flows to CEEC	Portfolio investment liabilities to CEEC, million USD	IFS	Portfolio flows to CEEC
Domestic explanatory variables			
Domestic interest rate paid on deposit	Quarterly deposit rate, %	IFS	Domestic deposit rate
Appreciation/Depreciation of the domestic exchange rate against US dollar	Quarterly decline/growth of exchange rate against US dollar, %	IFS/Authors calculations	Exchange rate changes
Political Risk Index	Average index values over quarter, points	International Country Risk Guide	Political risk
Financial Risk Index	Average index values over quarter, points	International Country Risk Guide	Financial Risk
Domestic GDP growth rate	GDP growth rate, %	IFS/Authors calculations	Domestic GDP growth
Relative size of economy	Ratio of domestic GDP to GDP of all CIS countries, %	IFS/Authors calculations	Ratio of GDP
Dummy to account for Russian default effect	Dummy takes value zero before default and one afterwards		Russian default dummy

Table 2. The Determinants of Portfolio Flows into the CIS: Estimation Results

Variable	General Specification	With dummy for Russian default	Group of larger countries	Group of smaller countries
Constant	-2282.9*** (720.9)	-213.9 (770.9)	11314 (1380.1)	-40.7*** (13.7)
US T-bills yield	52.6 (54.5)	58.0 (48.5)	106.7 (87.9)	0.5 (0.8)
S&P 500 yield	44.1*** (14.6)	24.2*** (8.8)	38.0*** (14.7)	0.08 (0.1)
EM Price Index	-19.4** (9.5)	-	-	-
Domestic deposit rate	16.5* (9.1)	1.5 (8.9)	-28.9* (16.7)	0.5** (0.2)
Exchange rate changes	-3.3 (8.9)	1.7 (8.3)	-20.3* (11.2)	-
Political risk	28.1*** (10.4)	24.7*** (9.6)	20.9 (17.8)	0.3 (0.2)
Financial risk	-	-	-	0.9*** (0.3)
Ratio of GDP	11.6*** (2.5)	6.3** (2.5)	-	-2.4* (1.2)
Portfolio flows to CEEC	0.05* (0.03)	0.07** (0.03)	0.1** (0.05)	-
US GDP growth	-3.5 (38.6)	-37.8 36.2	-	-
Domestic GDP growth	10.2 (13.9)	14.9 (12.9)	-	-
Russian default dummy	-	-1686.2*** (303.4)	-2725.5*** (477.7)	-18.2* (9.4)
R2	0.22	0.32	0.39	0.14
P-value for Wald test for joint significance	0.00	0.01	0.00	0.04

*** - significant at 1% level
** - significant at 5% level
* - significant at 10% level
values in the brackets show standard errors

Table 3. Testing stability of the influence of explanatory variables over time

Variable	Testing the stability of influence of GDP growth	Testing stability of influence of deposit rate	Testing stability of world interest rate	Testing stability of yield on SP500
Constant	52.5 (764.6)	797.0 (802.9)	-57988*** (13050.6)	747.8 (698.0)
US T-bills rate	48.1 (47.8)	14.7 (48.7)	11532.4*** (2588.3)	21.9 (43.3)
S&P 500 rate	18.3** (8.9)	24.5*** (8.6)	12.5 (8.8)	209.7*** (28.1)
Domestic deposit rate	-2.2 (8.9)	-33.8** (13.4)	-6.8 (8.7)	-8.4 (8.1)
Exchange rate changes	-1.2 (8.3)	1.6 (8.1)	0.9 (7.9)	1.9 (7.4)
Political risk	28.1*** (9.6)	24.6*** (9.3)	15.5* (9.4)	11.7 (8.7)
Ratio of GDP	6.1** (2.5)	9.7*** (2.7)	3.1 (2.5)	2.1 (2.3)
Portfolio flows to CEEC	0.06** (0.03)	0.08*** (0.03)	0.07** (0.03)	0.05** (0.03)
US GDP growth	-27.9 (35.8)	-38.7 (35.1)	-17.4 (34.6)	-12.8 (32.3)
Domestic GDP growth	65.4*** (23.0)	21.5* (12.7)	6.1 (12.5)	4.3 (11.6)
Russian default dummy	-2084.7*** (334.4)	-3028.9*** (487.9)	56867.7*** (13209.1)	-1551.8*** (269.8)
Domestic GDP growth after the crisis of 1998	-61.6*** (23.4)	-	-	-
Deposit rate after the crisis of 1998	-	63.7*** (18.5)	-	-
World interest rate after the crisis of 1998	-	-	-14496.8*** (2592.9)	-
Yield on SP500 after crisis of 1998	-	-	-	-204.7*** (29.8)
R2	0.35	0.37	0.39	0.47
P-value for Wald test for joint significance	0.00	0.00	0.00	0.00

*** - significant at 1% level
** - significant at 5% level
* - significant at 10% level
values in the brackets show standard errors

Table 4. Testing stability of the influence of explanatory variables, cont.

Variable	Testing stability of influence of political risk	Testing stability of influence of portfolio flows to CEEC
Constant	-2007.7 (1278.6)	-211.9 (769.2)
US T-bills yield	48.0 (48.5)	48.1 (48.9)
S&P 500 yield	22.8** (8.8)	21.0** (9.1)
Domestic deposit rate	1.6 (8.9)	2.3 (8.9)
Exchange rate changes	3.0 (8.3)	1.3 (8.3)
Political risk	56.3* (20.5)	23.4** (9.7)
Ratio of GDP	5.5** (2.6)	6.2** (2.5)
Portfolio flows to CEEC	0.07** (0.03)	0.4 (0.25)
US GDP growth	-36.3 (35.9)	-30.6 (36.5)
Domestic GDP growth	17.7 (13.0)	13.0 (13.0)
Russian default dummy	741.2 (1417.5)	1598.6 (309.6)
Political risk after the crisis of 1998	-41.3*** (23.6)	-
Portfolio flows to CEEC of the crisis of 1998	-	-0.3 (0.25)
R2	0.33	0.32
P-value for Wald test for joint significance	0.00	0.00

*** - significant at 1% level
** - significant at 5% level
* - significant at 10% level
values in the brackets show standard errors

Appendix 1. Overview of Empirical Research on the Determinants of Portfolio Capital Flows

Study	Model	Dependent Variables	Independent Variables	Other independent Variables
Gordon and Gupta (2003)	Portfolio allocation choice. OLS estimates	Monthly Foreign Institutional Investors equity flows in millions of US dollars and as a % of market capitalization on the BSE	Global: 12 month % change in industrial production; mom % yield in NASDAQ, SP, DOW; 3 month LIBOR in USD, Federal Fund Rate, Treasury bill rate. Regional: mom % change in Morgan Stanley Cap International (MSCI) emerging market index; dummy for currency crises; industrial production growth in emerging markets. Domestic: 12 month % change, mom % yield in BSE index; mom % change in exchange rate with respect to USD; sovereign credits ratings; dummies to capture political events, turnover at BSE/marcup.	Variance and covariance returns on the BSE, the NASDAQ and the MSCI emerging market index, dummies for seasonal effects
Garibaldi et al. (2001)	OLS; Wide range of possible explanatory variables	Inward portfolio investments per capita and per GDP	General to all flows: Natural log of average Inflation; fiscal balance as a percent of GDP; lagged growth; pre-announced exchange rate regime dummy; multiple exchange rates; liberalization index from De Melo et al (1997); institutional quality indices from WDR. Specific to PI: security market index; PI restriction index; real Treasury bill rate; external debt per capita; international reserves per capita; ratio of short-term debt to total.	different dummies
Claessens et al. (1998)	Fixed effect model	Private capital flows	Push factors: US dollar 6-month LIBOR interest rate; economic growth in OECD countries. Pull factors: liberalization index from De Melo et al. (1997) to account for reform efforts; GDP growth rates; inflation; fiscal balance; private savings; change in countries reserves as an indicator for creditworthiness; nominal domestic interest rate minus the rate of change in the local exchange rate minus US interest rate; domestic credit growth.	Dummies
Hernandez et al. (2001)	Panel regression	Private capital flows	Push factors: real ex-post international interest rate (US dollar 3-month LIBOR minus the US CPI 3 month inflation); net private cap flows available to all developing countries minus the flows received by country j as a share of GDP of major industrial countries; economic activity (GDP) in industrial countries. Domestic variables: real GDP growth; public sector balance as a share of GDP; gross domestic investment as a share of GDP; total export as a share of GDP; foreign debt service as a share of GDP; growth in banking sector nominal credit; real exchange rate appreciation during past year.	To test contagion effect: inflation; CA balance; the stock of int. reserves; the stock of foreign debt, total export; similarity index
Chuhan et al. (1993)	Panel data approach	Gross bond flows; Net equity flows	Global factors: US i-rates; US industrial activity. Country-specific factors: secondary market price of a countries debt; the country's credit rating; the price-earning ratio; the return on domestic stock market; black market premium; first principal components.	
Ahmed et al. (2005)	Dynamic panel using GMM	Ratio of portfolio flows to GDP	Domestic variables: lagged GDP per capita growth; index of law and order from International Country Risk Guide; ratio of imports and exports to GDP; annual standard deviation of monthly changes in the real effective exchange rate; inflation volatility; three proxies for capital account controls from IMF's AREAER; # of telephones per 1000 people; fuel export receipts as a % of export; domestic credit to the private sector and domestic stock market capitalization as a % of GDP. Global factors: real short-term and long term US i-rates.	Lagged capital inflow as a % of GDP to capture agglomerati on effect
Fernandez-Arias (1994)	Fixed-effect model	Portfolio flows both equity and bonds	External returns were proxied by annualized 10-year US bond nominal yields; the countries capacity to pay index was proxied by the debt secondary market price; stock of portfolio liabilities proxied by accumulating portfolio flows after 1988; the domestic investment climate parameter is indirectly measured as a residual.	All the variables are expressed as deviations from their 1989 average level
Hernandez and Rudolph (1995)	Panel data for 1986-1993; A stock-adjustment model	Total long-term private flows as a ratio of GDP	Domestic variables: two year moving average of gross domestic investment as a ratio of GNP; two year moving average of aggregate private consumption as a ratio of GNP; total external debt minus stock of international reserves as a ratio of GNP; total stock of foreign liabilities; volatility of the real effective exchange rate; real export growth. Global: US i-rates (US three year government bond yield, twelve month US treasury bond rate, first principal component of five interest rates and the US production index)	One lag of the dependent variable
Dasgupta and Ratha (2000)	Time series; Panel data estimation; Two stage process of investing int.		Factors specific to developing countries: real i-rate; lagged dep. Variable; GDP growth in developing countries; world GDP growth rate; dummy for financial crisis. Pull variables: creditworthiness indicator such as CA balance with one year lag; per capita income; three year MA of GDP growth rate; private net non-FDI flows to all developing countries; net FDI as a % of GDP.	Regional dummies; inflation and exchange rate appreciation; WB lending commitments
Calderon et al. (2003)	Dynamic panel estimation procedure (pooled mean group estimator developed by Pesaran, 1999)	NFA position normalized by wealth	Expected return proxied by composite index (real per capita GDP growth, inverse of black market premium, liquid liabilities to GDP, real imports plus exports to GDP, indices of governance, negative of government consumption to FDP, population size) and also perceived risk measured by composite index (standard deviation of real per capita GDP growth, ratio of external debt to debt plus equity external liabilities, average and standard deviation of inflation, standard deviation of RER standard deviation of TT, standard deviation of import plus export to GDP, negatives of indices of governance, negative of quasi-liquid liabilities to GDP).	Co-movement was measured as correlation of the relevant return index in a country and the rest of the world

Appendix 1. cd. Overview of Empirical Research on the Determinants of Portfolio Capital Flows

Study	Model	Dependent Variables	Independent Variables	Other independent Variables
Calderon et al. (2003)	Dynamic panel estimation procedure (pooled mean group estimator developed by Pesaran, 1999)	NFA position normalized by wealth	Expected return based on real per capita GDP growth and perceived risk as standard deviation of real per capita GDP growth. Expected return as real stock market return and perceived risk as standard deviation of real stock market return.	Co-movement was measured as correlation of the relevant return index in a country and the rest of the world
Taylor and Sarno (1997)	Error correction models	Monthly net US equity flows; Data the same as in Chuhan et al (1993)	Country-specific: country credit rating; black market exchange rate premium. Global: treasury bill rate and government bond yield; level of real US industrial production	
Fedderke and Liu (2001)	ARDL error correction version	Four different measures of cap flows in annual form	Rate of return variables: exchange rate adjusted interest differentials; % change of GDP. Risk variables: over/undervaluation of the exchange rate in term of PPP, political rights index, political instability index.	Dummies
Fiess (2003)	Multivariate cointegrati on analysis	Cap flows data comprises monthly records of bond, equity and syndicated loan flows	Global factors: US long-term interest rates; first principal component. Pull factors: residual from a regression of the country EMBI component on the first principal component; ratio of total public debt to GDP; primary balance to GDP ratio.	
Alfaro et al. (2005)	Cross-country regressions	Inflows of total equity investments per capita	Domestic variables: years of total schooling in total population; International Country Risk Guide (ICRG) political safety variables as a measure of institutional quality; distance using GDP shares as weights; inflation volatility; capital controls; sovereign risk; corporate tax; share of credit provided by deposit money banks	
Kim (2000)	Structural decomposition analysis	Balance on capital and current accounts	Domestic variable: terms of trade; domestic income; real exchange rate; real money supply; domestic price level. External factors: foreign income; foreign interest rate.	
Bekaert and Harvey (1998)		Net US equity flows	1) Cost of capital, correlation with world market return, volatility; 2) Asset concentration ratios, market size and liquidity; 3) foreign exchange volatility, real exchange rate, real GDP per capita, inflation, interest rate, size of trade sector, fiscal deficit; 4) Country risk.	
Carlson and Hernandez (2002)	Panel data regression with fixed effects; SUR	Portfolio equity investment	Economic Fundamentals: GDP; GDP deflator; stock of international reserves; inflation rate; exchange rate; stock of domestic credit to Central Bank; interest rate paid on deposits; LIBOR; real exchange rate appreciation; yield on government US bonds; growth rate of real GDP in USA, ratio of reserves to M2; expansion of bank credit;	
Odedokun (2003)	Panel regression with fixed effects	Total portfoli capital flows as a fraction of GDP	Variables expressed for the source country, all developing countries and destination country of cap flows: *Per capita income*; *interest rate*; *economic growth*; *phase of economic cycle*; *openness in the BOP cap account*; *inflation rate* and *monetary growth*; *private debt to GDP ratio; public debt to GDP ratio*.	

Appendix 2. Sample Statistics

	Valid N	Mean	Minimum	Maximum	Std.Dev.
	Portfolio Investment Liabilities, million USD				
Armenia	42	0.348	-12.120	9.130	3.058
Belarus	42	0.662	-58.900	53.900	17.762
Kazakhstan	42	79.142	-108.843	703.501	160.287
Kyrgyzstan	42	4.695	-11.206	101.000	22.020
Moldova	42	-2.174	-39.670	15.670	8.195
Russia	42	481.045	-11426.100	8061.940	2952.543
Ukraine	42	28.881	-825.000	1347.000	471.356
	Portfolio Investment Liabilities as a Ratio of GDP, %				
Armenia	42	0.076	-2.457	1.533	0.613
Belarus	42	0.043	-2.079	2.516	0.599
Kazakhstan	42	0.750	-1.665	6.513	1.756
Kyrgyzstan	42	-0.031	-2.364	2.288	0.682
Moldova	41	-0.594	-13.508	3.786	2.458
Russia	42	0.191	-18.013	8.705	3.714
Ukraine	42	-0.210	-7.229	8.118	3.635
	Global Explanatory Variables, %				
Yield on US Treasure securities	42	3.724	0.930	6.200	1.755
Yield on SP500	42	2.092	-17.634	20.867	8.509
US GDP growth	42	3.310	-1.400	7.500	2.069
Portfolio flows to CEEC	39	1907.829	-1063.348	9790.267	2625.735
	Domestic Deposit Interest Rate, %				
Armenia	42	16.535	4.526	42.867	10.095
Belarus	42	21.705	7.600	49.900	10.862
Kazakhstan	39	11.959	5.400	31.900	6.067
Kyrgyzstan	42	15.289	3.780	39.590	12.376
Moldova	41	17.581	9.920	28.767	5.832
Russia	42	12.680	3.367	61.700	15.276
Ukraine	42	14.724	6.574	48.700	8.868
	Exchange Rate Changes				
Armenia	42	0.238	-5.939	7.959	2.829
Belarus	42	15.623	-0.623	138.662	28.329
Kazakhstan	42	1.796	-6.093	40.397	6.771
Kyrgyzstan	42	3.433	-6.231	31.737	8.094
Moldova	42	2.885	-7.466	51.134	9.183
Russia	42	5.232	-3.853	90.543	16.212
Ukraine	42	2.782	-4.219	45.326	8.017
	Political Risk Index, points				
Armenia	32	58.380	54.000	61.000	2.044
Belarus	33	61.000	56.667	65.000	2.460
Kazakhstan	31	70.720	68.000	74.500	1.613
Kyrgyzstan	0				
Moldova	31	65.468	55.333	69.000	3.521
Russia	42	61.373	42.667	68.833	6.672
Ukraine	33	62.227	56.167	69.000	4.254

Appendix 2. cd. Sample Statistics

	Valid N	Mean	Minimum	Maximum	Std.Dev.
	Financial Risk Index, points				
Armenia	33	31.616	9.833	39.500	6.965
Belarus	33	34.828	28.500	40.500	4.129
Kazakhstan	31	37.016	28.000	40.000	2.684
	Valid N	Mean	Minimum	Maximum	Std.Dev.
Kyrgyzstan	0				
Moldova	31	29.667	20.000	36.500	5.037
Russia	42	37.548	23.167	47.000	5.847
Ukraine	33	36.859	25.833	42.000	4.919
	Ratio of country GDP to total GDP of CIS, %				
Armenia	42	0.519	0.182	1.271	0.229
Belarus	42	3.109	2.130	4.275	0.416
Kazakhstan	42	5.769	3.695	10.429	1.306
Kyrgyzstan	42	0.372	0.179	0.742	0.127
Moldova	41	0.436	0.261	2.347	0.324
Russia	42	79.812	66.956	84.879	3.358
Ukraine	42	9.993	7.729	15.621	1.748

Appendix3. Correlation matrix

	Portfolio flows as ratio to GDP	US T-bills yield	S&P 500 yield	EM Price Index	Domestic deposit rate	Exchange rate changes	Political risk	Financial risk	Portfolio flows to CEEC	Ratio of GDP	Domestic GDP growth	US GDP growth
Portfolio flows as ratio to GDP	1.0000											
US T-bills yield	0.0150	1.0000										
S&P 500 yield	0.0615	-0.0556	1.0000									
EM Price Index	0.0403	-0.2716	0.7914	1.0000								
Domestic deposit rate	-0.0279	0.4851	0.0592	-0.0552	1.0000							
Exchange rate changes	-0.1660	0.2886	0.1726	0.0904	0.3202	1.0000						
Political risk	0.3116	-0.2684	-0.0251	0.0856	-0.1939	-0.1305	1.0000					
Financial risk	0.2411	-0.4204	-0.1228	0.0133	-0.4357	-0.3086	0.4365	1.0000				
Portfolio flows to CEEC	0.1516	-0.3606	-0.0111	0.0583	-0.3513	-0.1578	0.1633	0.3709	1.0000			
Ratio of GDP	0.1881	0.1063	0.0643	-0.0311	-0.0680	-0.0082	-0.0476	0.2914	-0.0786	1.0000		
Domestic GDP growth	0.2031	-0.3431	-0.2631	-0.1583	-0.3890	-0.8715	0.1478	0.3606	0.1846	-0.0319	1.0000	
US GDP growth	0.0768	0.0523	0.3876	0.3321	0.0964	0.1118	-0.0507	-0.1584	-0.0125	0.0891	-0.1280	1.0000